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| 10/828,745 | 04/21/2004 | Michael L. Whitehead | 4011 | 5487 |

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| EXAMINER |
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ISSING, GREGORY C

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| ART UNIT | PAPER NUMBER |
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3662

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08/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/828,745 | Applicant(s) WHITEHEAD ET AL. | |
| | Examiner Gregory C. Issing | Art Unit 3662 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31 and 35-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 31 and 35-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The position solution processor and the structure attitude determining processor, as presently claimed, are not disclosed in the specification as originally filed. This is considered new matter. The original application does not include a position solution processor using signals from only one GNSS receiver. In fact, the disclosed embodiment in [0056] only provides support for utilizing signals from each of a plurality of GNSS receivers, wherein an insufficient number of signals are available at each of the separate receivers, in order to determine the location of some point on the barge and could be determined from the conglomerate of signals. However, it is not seen where in the specification as originally filed there is a disclosure for determining the position of one of the first or second points associated with a respective GPS antenna on the basis of a GNSS-determined position of the other of the first or second point as determined by the satellite signal received at the other of the first or second point, a clock signal and a known relative orientation of said points. Additionally, it is not seen where in the original specification the attitude of the structure is determined in any manner. It is noted that the reception of GNSS, e.g., GPS, signals and the use of a resident clock signal, at a single receiver, is conventional in the determination of position in any/every GPS

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receiver; thus the position solution processor does not appear to distinguish over any prior GPS receiver. Moreover, there is nothing novel regarding determination of position of a remote target given the position of user device and a known distance/direction to the remote target; this is a simple translation of position. Furthermore, the claim defines that the antennas have known and fixed location relative to each other; thus, given a position of one, the other is always known, no solution processor appears to be required to determine the other since according to well-known mathematical principles, if a first object's position is known in a coordinate frame and the first and a second object have a known relative location to each other, the second object's position is known.

3. Claim 37 is insufficiently disclosed in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 31 and 35-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 31 and 35-37 are misdescriptive. The preamble sets forth a system for determining the GNSS-defined positions of first and second points on a structure. In the position solution processor the GNSS-defined positions are determined, however, only one of the antennas, which is associated with a respective point, is defined as having received any GNSS signal, while the other point is determined by apparently vectorally adding the relative location information to obtain the other. Thus, the use of "GNSS-defining position" appears misdescriptive. Also in the position solution processor, it is stated that one of the inputs is the

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“known relative orientation of said points” however, support for such is lacking since the claim uses the language “having known and fixed relative locations to each other”.

7. The amendment to the specification and drawings are acknowledged but do not provide support for the invention as now claimed.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 31 and 35-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Zimmerman et al (7,027,918).

10. Zimmerman et al disclose the use of multiple antenna elements 104/106 attached to a structure 102 at two fixed points wherein each antenna element is coupled to a respective receiver module 204 and 202 (11:5-16) which share a common clock 208. The antennas receive signals from satellites wherein it is taught that antenna 104 receives signals from satellites 110, 112, and 114 and antenna 106 receives signals from satellites 108, 110 and 112 such that signal blockages result in the antennas not being able to receive the full complement of satellites for a position determination. A constraint sensor 212 provides information to constrain the solution and may include one of the following: angular motion, inertial measurement of the attitude, measurement of some aspect of the relative locations of two or more antennas (11:20+). It is

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also taught that a common clock can provide a constraint or that measurement of one or more degrees of freedom may act as a constraint. The master processor solves for the antenna positions using code phase or carrier phase techniques.

11. Claims 31 and 35-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilson (6,292,132).

12. Wilson (6,292,132) discloses a system and method for determining position including first and second points 14/16 associated with a respective antenna Ant1/Ant2 and GPS receiver 36/38 and which receivers share a common clock 40 (Figure 2). The antennas are arranged on a vehicle so as to have a known and defined spacing and orientation relative to one another and the vehicle longitudinal axis (3:49-52). During conditions when the receivers are not capable of receiving the required number of satellite signals, the processor 34 remains capable of determining position/attitude of the device using the multiple antenna in conjunction with constraint settings, wherein it is taught that the use of a common clock removes the need for one of the satellites (2:30-37).

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Rorabaugh is cited for its pertinency to determining absolute positions of two points coupled to GPS antenna/receivers when neither of the antenna is capable of receiving signals from more than three satellites; as noted by the applicants in their argument, the two points of Rorabaugh are not fixed in a known location relative to a structure and do not determine attitude.

15. Each of Toda et al (6,611,228) and Fukuda et al (2002/0029110) disclose that it is well known to set up an arrangement of a plurality of antennas on a structure in order to determine

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heading and/or attitude wherein the relative locations of the antennas are fixed and have a known relative location to a reference antenna and thus to the structure upon which they are coupled.

16. Tang et al (5,933,110) disclose a vessel attitude determination system and method wherein a plurality of antennas 106/108 are attached to a vessel structure 100 for receiving GPS signals such that a baseline vector is determined between the two so as to define a known location of the antennas relative to each other.

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

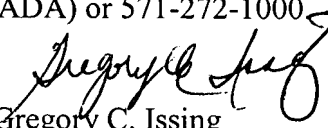
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory C. Issing whose telephone number is (571)-272-6973. The examiner can normally be reached on Monday - Thursday 6:00 AM- 4:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571)-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Gregory C. Issing
Primary Examiner
Art Unit 3662

gci